

KING FAHD UNIVERSITY OF PETROLEUM & MINERALS
DEPARTMENT OF MATHEMATICAL SCIENCES
DHAHRAN, SAUDI ARABIA

STAT 211: BUSINESS STATISTICS I

Semester 041

Final Exam

Sunday January 9, 2005

7:30 - 10:30 am

Please **circle** your instructor' s name:

- Hassen A. Muttlak
- Raid Anaboosi
- Walid S. Al-Sabah

Name: _____

ID# _____

Section _____

Part	Question No	Full Marks	Marks Obtained
I	1	10	
	2	4	
	3	6	
	4	5	
II	1	7	
	2	7	
	3	6	
	4	6	
	5	8	
	6	10	
	7	7	
	8	11	
	9	13	
	Total	100	

Part I

- 1) (3 + 3 + 4 = 10 points) The following values represent the population of interest rates (in percents) being charged by the banks in a particular city:

6.9	7.5	6.5	5.9	7.3	6.8	6.5
7.0	7.0	7.2	7.5	7.8	6.0	7.0

- i) Calculate the mean, median and mode of the data.
- ii) Calculate the range and the standard deviation.
- iii) Draw a stem and leaf diagram and comment on the shape of graph.
- 2) (4 points) A large hotel chain has determined that 60 percent of all calls for reservations request non-smoking rooms. Recently, the customer service manager for the company randomly selected 8 calls. What is the probability that at least 2 of the callers requested a non-smoking room?

- 3) (3+ 3 = 6 points) The number of accidents that occur in a small northern city in Saudi Arabia each day follows this probability distribution:

Accidents	Probability
0	0.25
1	0.20
2	0.30
3	0.15
4	0.10

- i) What is the mean and variance of the number of accidents in the city?

- ii) What is the probability that at most 2 accidents occur per day?

- 4) (5 points) When a customer comes to a bank, there are three primary locations they may select to go to: teller, loan officer, or manager. Based on past experience, the following probability distribution applies:

Location	Probability
Teller	0.60
Loan Officer	0.30
Manager	0.10

Seventy percent of customers are males.

What is the probability that the next customer will be male and will go to either the teller or the manager?

- 3) (6 points) A major textbook publisher has a contract with a printing company. Part of the contract stipulates that no more than 5 percent of the pages should have any type of printing error. As a quality control measure, the publisher periodically selects a random sample of $n = 100$ pages. Then, depending on the proportion of pages with errors, they either say nothing to the printer or they complain that the quality has slipped. Suppose the publisher wants no more than a 0.10 chance of mistakenly blaming the printer for poor quality, what should the cut-off proportion be?
- 4) (6 points) A major shipping company has stated that 96 percent of all parcels are delivered on time. To check this, a random sample of $n = 64$ parcels were sampled. Of these, 92 percent arrived on time. If the company's claim is correct, what is the probability that 92% or fewer of the parcels arrive on time?

- 5) (4 + 4 = 8 points) In an effort to estimate the mean amount spent per visit by customers of a food store, the manager has selected a random sample of 100 cash register receipts. The mean of these was SR185 with a standard deviation equal to SR40.00.

i) Construct a 90 percent confidence interval estimate for the mean.

ii) If the sample size was 20, what assumptions do we need, and what would the critical value be?

- 6) (6 + 2 + 2 = 10 points) An educational organization is interested in estimating the mean number of minutes per day that children between the age of 6 and 18 spend watching television per day. The organization selected a random sample of $n = 25$ children between the ages of 6 and 18 and recorded the number of minutes of TV that each person watched on a particular day. The mean time and standard deviation were 191.3 and 21.5 minutes respectively.

i) Develop an interval estimate with 98 percent confidence.

ii) What is the margin of error?

iii) What are the assumptions that you need to answer the above two parts?

- 7) (7 points) A drug store owner plans to survey a random sample of his customers with the objective of estimating the mean amount spent on pharmaceutical products during the past three months. He has assumed that the population standard deviation is known to be SR55.00. Given this information, how many customers does the owner need to sample in order to estimate the population mean with 95 percent confidence and a margin of error of \pm SR7.00?

- 8) (7 + 4 = 11 points) An accounting firm has been hired by a large computer company to determine whether the proportion of accounts receivables with errors in one division (Division 1) exceeds that of the second division (Division 2). The accounting firm has selected random samples of accounts from each division with the following results:

	Division 1	Division 2
Sample size	$n_1 = 100$	$n_2 = 80$
Errors found	$x_1 = 15$	$x_2 = 8$

- i) Construct a 99% confidence interval for the difference in the proportion of errors in the two divisions.

- ii) Do you think that there is a difference between the two divisions? Explain.

- 9) (7 + 2 + 2 + 2 = 13 points) The AAA Bank is interested in whether there is a difference between average daily balances in checking accounts that are joint accounts (two or more members per account) versus single accounts (one member per account). A random sample of checking accounts was selected with the following results:

Single Accounts

$$n = 18$$

$$s = \text{SR}256$$

$$\bar{x} = \text{SR}1,123$$

Joint Accounts

$$n = 24$$

$$s = \text{SR}300$$

$$\bar{x} = \text{SR}1,245$$

- i) Construct a 95% confidence interval estimate for the difference in means between the two types of accounts.

ii) What assumptions are you using?

iii) Interpret your confidence interval.

iv) Does there seem to be a difference between the two types of accounts? Why?